Docket No.: DAT-0002
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Ziya Aral, et al.

Application No.: 09/910,662 | Confirmation No.: 2628

Filed: July 20, 2001 | Art Unit: 2151

For: METHOD AND APPARATUS FOR ASYNCHRONOUS MIRRORING USING TCP/IP INTERNET PROTOCOL | Examiner: Nghi V. Tran

APPEAL BRIEF (RESUBMITTED)

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an Appeal Brief under 37 C.F.R. § 41.37 appealing the final decision of the Examiner dated August 22, 2006. This Brief is being submitted following receipt of a Notice of Non-Compliant Appeal Brief mailed on July 12, 2007. The Notice allows filing of the amended Brief within one month or thirty days from the mailing date of the Notice, and thus Brief is timely filed.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is DataCore Software Corporation, of Fort Lauderdale, Florida. An assignment of all rights in the present application to DataCore Software Corporation was executed by the inventors and recorded by the United States Patent and Trademark Office at Reel 012016, Frame 0224.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Current Status of Claims

A complete listing of the claims with corresponding status is provided as follows:

Claim 1. (Rejected).

Claim 2. (Rejected).

Claim 3. (Rejected).

Claim 4. (Rejected).

Claim 5. (Rejected).

Claim 6. (Rejected).

Claim 7. (Rejected).

Claim 8. (Rejected).

Claim 9. (Rejected).

Claim 10. (Rejected).

Claim 11. (Rejected).

Claim 12. (Canceled).

Claim 13. (Canceled).

Claim 14. (Canceled).

Claim 15. (Canceled).

Claim 16. (Canceled).

Claim 17. (Canceled).

Claim 18. (Rejected).

Claim 19. (Rejected).

Claim 20. (Rejected).

Claim 21. (Rejected).

Claim 22. (Rejected).

Claim 23. (Rejected).

Claim 24. (Rejected).

Claim 25. (Rejected).

Claim 26. (Rejected).

B. Claims On Appeal

Appellant hereby appeals the final rejection of claims 1-11 and 18-26.

IV. STATUS OF AMENDMENTS

Following the Final Rejection dated August 22, 2006, a Response to the Final Office Action was filed on February 15, 2007. The Response was a request for reconsideration traversing the rejections of record, with no amendments to the claims. An Advisory Action was mailed on March 7, 2007, wherein the Examiner indicated that the request for reconsideration had been considered, but was deemed not to place the application in condition for allowance, with an appended explanation.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following description is for illustrative purposes and is not intended to limit the scope of the invention.

Certain embodiments of the present invention relate to data mirroring between remote and local storage systems. (*e.g.*, Specification at ¶0012, p. 5, lines 14-15). IO transactions to a storage disk of the local storage system are intercepted, a series of write

transactions to the local storage disk is identified, and an exact copy of the series of write transactions is stored in a series of files that are created on the file system of the local storage system. (*e.g.*, ¶0013, p. 6, lines 5-12). This series of regular file system files can then be transmitted to the remote storage system via a non-propriety network protocol to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to the storage disk of the local storage system. (*e.g.*, ¶¶0014-0015, p. 6, line 21 through p. 7, line 20).

Independent claim 1 recites: A system for mirroring write operations from a local storage system onto a remote storage system (*e.g.*, FIG. 2; FIG. 3A; FIGs. 5-8; specification at ¶0029, p. 10, lines 5-13), the system comprising:

an asynchronous mirroring driver resident in the local storage system (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0030, p. 10, lines 14-20; ¶0045) for intercepting I/O transactions to a storage disk of the local storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045), identifying a series of write transactions issued to said storage disk, making an exact copy of the series of write transactions (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045), and storing said exact copy within a series of files that are created on a file-system of the local storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045); and

a first asynchronous mirroring coordinator resident on the local storage system (*e.g.*, FIG. 2; FIG 3A; specification at ¶0032-33, p. 12, lines 1-15) for invoking a file transfer system to transmit the series of files on the local file-system of the local storage system to a file system of the remote storage system via a non-proprietary network protocol (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0032-33, p. 12, lines 1-15; ¶0034; ¶¶0046-0047) to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0032-33, p. 12, lines 1-15; ¶¶0046-0047).

Independent claim 3 recites: [a] method for mirroring write operations from a local storage system to a remote storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; FIGs. 5-8; specification at ¶0029, p. 10, lines 5-13), the method comprising the steps of:

intercepting I/O transactions to a storage disk of the local storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045);

identifying a series of write transactions to said storage disk from the intercepted I/O transactions (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045);

storing an exact copy of the series of write transactions within a series of files that are created on a file-system of the local storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045);

transmitting the series of files from the local storage system to the remote storage system through an Internet connection (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0032-33, p. 12, lines 1-15; ¶0034; ¶¶0046-0047) to accommodate a reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0032-33, p. 12, lines 1-15; ¶¶0046-0047).

Independent claim 5 recites: A computer program product for mirroring write operations from a local storage system to a remote storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; FIGs. 5-8; specification at ¶0029, p. 10, lines 5-13), the computer program product comprising:

an asynchronous mirroring driver software module for intercepting I/O transactions to a storage disk of the local storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045), identifying a series of write transactions issued to said storage disk (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045), making an exact copy of the series of write transactions, and storing said exact copy within a series of files that are created on a file-system of the local storage system (*e.g.*, FIG. 2; FIG. 3A; FIG. 4; specification at ¶0031-32, p. 11, lines 1-20; ¶0045); and

a first asynchronous mirroring coordinator software module for invoking a configured file transfer system to transmit the series of files to a file system on the remote storage system via a non-proprietary network protocol (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0032-33, p. 12, lines 1-15; ¶0034; ¶¶0046-0047) to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the

local storage system (*e.g.*, FIG. 2; FIG. 3A; specification at ¶0032-33, p. 12, lines 1-15; ¶¶0046-0047).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented for consideration in this appeal are as follows:

Whether the Examiner erred in rejecting claims 1-6, 9-11, 18-21, 23 and 25 under 35 U.S.C. § 102(e) as being anticipated over U.S. Pat. No. 6,823,336 to Srinivasan et al. ("Srinivasan").[1]

Whether the Examiner erred in rejecting claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of U.S. Pat. No. 5,673,382 to Cannon et al. ("Cannon").

Whether the Examiner erred in rejecting claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of Cannon as applied to claim 7, and further in view of U.S. Pat. No. 5,713,014 to Durflinger.

The Notice of Non-Compliant Appeal Brief mailed July 12, 2007 requested a listing of a rejection under 35 U.S.C. 103(a) citing U.S. Pat. No. 6,502,205 to Yanai and U.S. Pat. No. 6,260,125 to McDowell. As noted in the original Brief, a paragraph mentioning these references was mistakenly retained from a previous Action following withdrawal of these grounds of rejection in favor of new grounds of rejection reliant upon the Srinivasan reference. This was confirmed prior to the filing of a Request for Reconsideration previously filed in this application. The Examiner treated the Request for Reconsideration accordingly, as clearly indicated in the comments included with the Advisory Action dated March 7, 2007 (continuation of note 11. contained on supplemental page in Advisory Action). (See also footnote 1 below, which was included in the original Brief).

These issues are discussed in the following section.

---

[1] The introductory paragraph to this rejection as found in the Final Office Action erroneously cites grounds (35 USC 103) and references previously relied upon and withdrawn by the Examiner. A reading of the rejection in the Action clearly indicates a 35 U.S.C. 102 anticipation rejection reliant upon solely the Srinivasan reference. The Examiner confirmed this reading of the rejection telephonically with the undersigned representative prior to Applicant's filing of the Request for Reconsideration on February 15, 2007.

VII. ARGUMENT

In the Final Office Action of August 23, 2006, the Examiner erred in rejecting claims 1-6, 9-11, 18-21, 23 and 25 under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,823,336 to Srinivasan et al. ("Srinivasan"); erred in rejecting claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of U.S. Pat. No. 5,673,382 to Cannon et al. ("Cannon"); and erred in rejecting claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of Cannon as applied to claim 7, and further in view of U.S. Pat. No. 5,713,014 to Durflinger.

VII.A. Grouping of claims: Claims 1-11 and 18-26 are currently pending in the application. Claims 1, 5, 9, 11, 18 and 20 stand or fall together. Claims 2 and 6 stand or fall together. Claims 3, 4, 10 and 19 stand or fall together. Claim 7 stands or falls alone. Claim 8 stands or falls alone. Claims 21, 22, 25 and 26 stand or fall together. Claims 23 and 24 stand or fall together.

VII.B The Examiner erred in rejecting claims 1-6, 9-11, 18-21, 23 and 25 under 35 U.S.C. § 102(e) as being anticipated by Srinivasan:

Independent claim 1 recites: recites: *[a] system for mirroring write operations from a local storage system onto a remote storage system, the system comprising:*

an asynchronous mirroring driver resident in the local storage system for intercepting I/O transactions to a storage disk of the local storage system, identifying a series of write transactions issued to said storage disk, making an exact copy of the series of write transactions, and storing said exact copy within a series of files that are created on a file-system of the local storage system; and

a first asynchronous mirroring coordinator resident on the local storage system for invoking a file transfer system to transmit the series of files on the local file-system of the local storage system to a file system of the remote storage system via a non-proprietary network protocol to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system.

Applicant's claimed invention provides asynchronous mirrored storage by intercepting I/O transactions to a storage disk of a local storage system, and retaining an exact copy of the corresponding write transactions within a series of regular file system files. The asynchronous mirroring coordinator may then transmit these files on any desired schedule to the file system of the remote storage system using a non-proprietary network protocol to accommodate an exact reproduction of the write transactions as issued to the storage disk of the local storage system.

These claimed features provide several advantages and distinctions over conventional systems. Retaining an exact record of write transactions allows a return to any point on a per-transaction basis in the event of failure on either the local or remote storage side. The overhead of managing a local buffer and corresponding with the remote system in response to regular write transactions is also avoided. Finally, implementation of file system files and non-proprietary network communication protocols (*e.g.*, IP and/or FTP) introduces flexibility and resiliency to the system.

Srinivasan clearly fails to disclose (or suggest) various claimed features. Specifically, in independent claim 1: (1) the I/O transactions to a storage disk are intercepted and an exact copy of the write transactions is retained; (2) the retained exact copy of the write transactions is stored within a series of files created on the file system of the local storage system; and (3) the series of files is transmitted to the remote storage system using a non-propriety network protocol to accommodate an exact reproduction of the series of write transactions at the remote storage system. These features are absent from Srinivasan.

Srinivasan discloses techniques for ensuring dataset consistency. That is, the "dataset" is provided on the local disk(s) and a duplicate of that "dataset" is separately maintained at the secondary or remote location. To accomplish this mirroring, Srinivasan does not retain exact copies of write transactions and store them in a series of file system files that are then transmitted to the secondary system. Instead, Srinivasan directly sends write transactions to the secondary system, which (on the secondary side) implements "A" and "B" buffers and corresponding read and write algorithms to service reads and writes that are requested by applications on the primary system. In servicing these reads and writes, changes are immediately made to the dataset on the primary system, and the same entire "dataset" is

mirrored on the secondary system, using the buffers and read/write algorithm. FIG. 2 of Srinivasan quite clearly illustrates these features. The write transactions are sent over a dedicated line 22, and the corresponding "A" and "B" dataset revisions (43, 44) are stored and maintained on the secondary side. There is absolutely no retaining of writes on the primary side, storing an exact copy of the write transactions in a series of file system files, and then transmitting those file system files to the remote storage system, as claimed by Applicant.

The dataset of Srinivasan is, of course, stored in some fashion at the primary and secondary locations. However, this is simply a duplicate of whatever is stored on the local disk (*e.g.*, a database, file(s), documents, etc.). Duplication (mirroring) is performed by maintaining consistency in the changes to the disk on both the local and remote sides.

A careful review of the position as stated in the Office Action also reveals that it either misconstrues or takes out of context what is stated in Srinivasan to allege that the reference discloses the features of Applicant's claimed invention. For example, the Examiner cites column 5, lines 17-36 as disclosing the interception of I/O transactions. However, this passage and the corresponding figure merely appear to exemplify that write transactions are concurrently sent to the remote location over a dedicated line. Accordingly, this cited passage merely reinforces that Srinivasan is fundamentally distinct from the claimed invention. This is because, as stated in this passage, the write transactions are directly sent to the secondary system right over the transmission line. There is no mention of storing an exact copy of a series of write transactions in a series of file system files on the primary (local) side.

Nor do other relied-upon passages support a conclusion that Srinivasan in any way discloses storing an exact copy of the write transactions in a series of file system files. For example, the Examiner apparently takes the position that Srinivasan makes an exact copy of the write transactions because Srinivasan "maintains a copy of the dataset." (Office Action, p. 3). In Srinivasan, the dataset is the data itself (*e.g.*, database, file(s), etc.) that appears in storage at the primary location, and (as a mirrored version) at the secondary location. In Srinivasan, revisions to the dataset are managed to ensure consistency at both locations. That is, when revisions to the dataset are made on the primary side, the Srinivasan system ensures that the same revisions are applied to the mirrored version of the dataset found on the secondary side. This is completely different from and thus does not disclose Applicant's claimed retention of the

exact copy of write transactions in a series of file system files, and then transmitting that series of file system files as claimed.

It is important to understand that the dataset is not the write transactions themselves, nor therefore an exact copy of the write transactions. The dataset is merely a representation of what is on the disk after the write transactions have been executed. The write transactions themselves are separate, even if they are used to effect what the dataset becomes. Srinivasan thus does not disclose storing the exact copy of the write transactions in file system files as is claimed.

It is also noted that the Examiner's position is illogical, or at least logically inconsistent. This is because the Examiner has construed the dataset of Srinivasan as being not only the database or other data that may be stored on the disk, but also a copy of the write transactions that had been applied to that dataset, as well as an example of storing the exact copy of the write transactions in a series of files, and finally transmitting the same (*i.e.*, the dataset) to the secondary location. The "dataset" of Srinivasan cannot be reasonably construed as disclosing all of these features. Applicant has previously requested a coherent explanation as to how this possibly could be the case, and the record remains lacking in this regard.

Furthermore, although the Examiner has not articulated a position as such, it is noted that the alternative embodiment of Srinivasan involving "delta volumes" as depicted in FIGs. 8 and 9 also fails to disclose or suggest the above-described features of Applicant's claimed invention. That is, this embodiment also fails to disclose storing an exact copy of write transactions issued to a storage disk on the local side in a series of file system files, or transmitting that series of files to the remote storage system to accommodate an exact reproduction of the series of write transactions as issued to the storage disk of the local storage system. This embodiment involves dual redundant lines 125, 126 that send updates to the primary and secondary systems. The "delta volumes" that are retained on both the primary and secondary systems do not represent storing exact copies of write transactions to the storage disk in file system files. Instead, these are representative of a consolidation or "delta set" of changes that are made to file system blocks and that comprise a set of changes to the file system blocks that, when viewed as a whole, leave the file system intact. Thus these delta volumes are neither an example of retaining an exact copy of write transactions to the disk, nor are they an example

of retaining such an exact copy in a series of file system files that are stored and ultimately sent to the remote storage system.

Finally, there are other claimed features that are absent from Srinivasan. For example, Srinivasan merely mentions "transmission line 22" and does not specify a non-propriety network protocol for transmitting the files. Rather, it appears that the transmission line disclosed in Srinivasan is a conventional dedicated line for providing mirrored storage. There is no mention of a network protocol, let alone a non-proprietary one for accommodating the transmission.

For reasons similar to those provided regarding claim 1, Srinivasan does not disclose or suggest the features recited in independent claim 5. Dependent claims 9, 11, 18 and 20 are also neither disclosed nor suggested by Srinivasan, since they incorporate the features respectively recited in these independent claims, as well as for their separately recited features.

Dependent claim 2 recites: *[t]he system claim 1 further comprising:*

a second asynchronous mirroring coordinator resident on the remote storage system for detecting the series of files on the file system of the remote storage system, opening the files and reading the exact copy of the series of write transactions in these files; and

an asynchronous mirroring driver resident on the remote storage system for receiving the exact copy of the series of write transactions from the second asynchronous mirroring coordinator and issuing the transactions to a remote device connected to the remote storage system which is configured to mirror the local storage device on the local storage system.

These additional features are also absent from Srinivasan. In Srinivasan, there is no detection of the series of files on the file system of the remote system, or opening such files and reading the exact copy of the series of write transaction, all features clearly recited in this claim. At best, updates may be received or write transactions may be iteratively executed on both the primary and secondary systems. There is no provision of such write transactions in files that are

transmitted to the secondary system. For reasons similar to those provided regarding claim 2, claim 6 is similarly neither disclosed nor suggested by Srinivasan.

Claim 3 recites: *[a] method for mirroring write operations from a local storage system to a remote storage system, the method comprising the steps of:*

intercepting I/O transactions to a storage disk of the local storage system;

identifying a series of write transactions to said storage disk from the intercepted I/O transactions;

storing an exact copy of the series of write transactions within a series of files that are created on a file-system of the local storage system;

transmitting the series of files from the local storage system to the remote storage system through an Internet connection to accommodate a reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system.

These claimed features are absent from Srinivasan. For reasons clearly stated above, Srinivasan does not disclose or suggest "storing an exact copy of the series of write transactions within a series of files that are created on a file-system of the local storage system," or "transmitting the series of files from the local storage system to the remote storage system ... to accommodate a reproduction at the remote storage system of the series of write transactions as issued ...."

With regard to independent claim 3, Srinivasan is also lacking in that it fails to disclose or suggest making such transmission of the series of files through an Internet connection. At best, Srinivasan generally discloses a connection. There is no mention of an Internet connection. Indeed, it would be completely counter-intuitive to conclude even the desirability of an Internet connection in the scheme disclosed by Srinivasan, where the primary and secondary systems are both accessed responsive to write commands through switching operations and access to either dataset revisions "A" or "B" (*e.g.*, as shown in FIG. 3 of

Srinivasan). A conclusion that these features disclose sending file system files with exact copies of a series of write transactions through an Internet connection is in no way supported by the reference.

Claims 4, 10 and 19 depend from claim 3 and thus incorporate the features recited therein. These dependent claims are thus distinct from Srinivasan for the reasons set forth above, as well as for the features separately recited in these claims.

Claim 21 recites: *[t]he system of claim 1, wherein the series of write transactions is one of a plurality of series of I/O transactions that are respectively retained in corresponding ones of the series of files, and individual ones of the series of files include pointers to accommodate sequencing the series of files, whereby a transaction level record of changes to the storage disk of the local storage system is provided for the remote storage system.*

These claimed features are also absent from Srinivasan. In fact, the passages of Srinivasan cited by the Examiner in the Office Action merely further support the conclusion that Srinivasan clearly does not disclose or suggest what is found in the independent claims, let alone the additional dependent claim features. That is, the Examiner refers to column 13, lines 40-65 of Srinivasan as purportedly disclosing the claimed "pointers to accommodate sequencing." However, this passage does not describe file system files that contain series of write transactions. Instead, this passage describes the sending of "delta set" information. Delta set information refers consolidated changes to the data. That allows the same consolidated changes to the remote (secondary) side so that the data remains consistent as a whole. There is no retained exact record of write transactions to the storage disk of the local storage system, within a series of file system files, or of having pointers to sequence those file system files.

Claims 22, 25 and 26 are also neither disclosed nor suggested by Srinivasan for the reasons stated regarding claim 21.

Claim 23 recites: *[t]he method of claim 3, wherein the series of write transactions is one of a plurality of series of I/O transactions that are respectively retained in corresponding ones of the series of files, and individual ones of the series of files include pointers to accommodate sequencing the series of files, whereby a transaction level record of changes to the storage disk of the local storage system is provided for the remote storage system.* These

claimed features are neither disclosed nor suggested for the reasons stated regarding independent claim 3 above, as well as the reasons stated regarding claim 21 above.

For the foregoing reasons, Appellant respectfully requests reversal of the Examiner's rejection of claims 1-6, 9-11, 18-21, 23 and 25 under 35 U.S.C. § 102(e) as being anticipated by Srinivasan.

VII.C The Examiner erred in rejecting claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of Cannon:

Claim 7 recites: *[t]he system of claim 1, wherein individual ones of the series of files comprise:*

a Header portion that includes information on the total size of the file;

an I/O Control Block portion which indicates address offsets where each transaction in the file is to be stored on the remotely located destination storage system, and which further indicates the size of the data for each transaction; and

a Data portion which contains the data for each transaction in the file.

These claimed features are not disclosed or suggested by Cannon. First, Cannon makes no mention whatsoever of the features described above in connection with independent claim 1. Cannon appears to describe locating a file by noting its offset within a storage volume. (Cannon, 8:41-46). Such a file offset does not disclose various features recited in the claim. Namely, the file offset of Cannon does not disclose the indication of address offsets for each transaction, information of the total size of the file corresponding to each write transaction, and data for each transaction.

Applicant submits that a prima facie case of obviousness has not been presented, since even in combination Srinivasan and Cannon would still fail to yield the claimed invention. Moreover, there is no apparent reason to conclude that Srinivasan and Cannon should be combined in the noted fashion. For one, Srinivasan does not even disclose the basic information in the series of files as claimed, as noted above. Furthermore, there would be no reason to look to Cannon regarding file system pointers.

Appellant respectfully requests reversal of the Examiner's rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of Cannon.

VII.D The Examiner erred in rejecting claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of Cannon as applied to claim 7, and further in view of Durflinger:

Claim 8 recites: *[t]he system of claim 7, wherein the Header portion further includes:*

a pointer to the I/O Control Block portion which indicates the offset where the I/O Control Block portion of the file begins; and

a pointer to the Data portion, which indicates the offset where the Data portion of the file begins.

Durflinger discloses a database management system that uses pointers to locate data positions within files. Usage of pointers for database management is clearly in a different context, and markedly different from Applicant's claimed invention. For that reason, there is no disclosure or suggestion in Durflinger of the particular pointers that are claimed by Applicant. There is no disclosure of a header that points to an I/O Control Block portion within the same file, or a pointer that points to a Data portion within the same file.

Since the combination of Srinivasan, Cannon and Durflinger would still fail to yield the features of Applicant's claimed invention, Applicant submits that a prima facie case of obviousness has not been presented regarding claim 8.

Appellant respectfully requests reversal of the Examiner's rejection of claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Srinivasan in view of Cannon and Durflinger.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132, or additional evidence entered by or relied upon by the Examiner is being submitted.

X. RELATED PROCEEDINGS

No related proceedings are referenced in section II above, or copies of decisions in related proceedings are not provided.

Appellant believes no additional fee is due with this Brief. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. DAT-0002 from which the undersigned is authorized to draw.

Dated: July 18, 2007

Respectfully submitted,

By _____
Christopher M. Tobin
Registration No.: 40,290
RADER, FISHMAN & GRAUER PLLC
Correspondence Customer Number: 23353
Attorney for Appellant

APPENDIX A - CLAIMS

1. (Previously Presented) A system for mirroring write operations from a local storage system onto a remote storage system, the system comprising:

an asynchronous mirroring driver resident in the local storage system for intercepting I/O transactions to a storage disk of the local storage system, identifying a series of write transactions issued to said storage disk, making an exact copy of the series of write transactions, and storing said exact copy within a series of files that are created on a file-system of the local storage system; and

a first asynchronous mirroring coordinator resident on the local storage system for invoking a file transfer system to transmit the series of files on the local file-system of the local storage system to a file system of the remote storage system via a non-proprietary network protocol to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system.

2. (Previously Presented) The system claim 1 further comprising:

a second asynchronous mirroring coordinator resident on the remote storage system for detecting the series of files on the file system of the remote storage system, opening the files and reading the exact copy of the series of write transactions in these files; and

an asynchronous mirroring driver resident on the remote storage system for receiving the exact copy of the series of write transactions from the second asynchronous mirroring coordinator and issuing the transactions to a remote device connected

to the remote storage system which is configured to mirror the local storage device on the local storage system.

3. (Previously Presented) A method for mirroring write operations from a local storage system to a remote storage system, the method comprising the steps of:

intercepting I/O transactions to a storage disk of the local storage system;

identifying a series of write transactions to said storage disk from the intercepted I/O transactions;

storing an exact copy of the series of write transactions within a series of files that are created on a file-system of the local storage system;

transmitting the series of files from the local storage system to the remote storage system through an Internet connection to accommodate a reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system.

4. (Previously Presented) The method of claim 3, further comprising:

passing the series of write transactions to a driver issuing the transactions to storage device of the remote storage system, which is configured to mirror the storage device on the local storage system.

5. (Previously Presented) A computer program product for mirroring write operations from a local storage system to a remote storage system, the computer program product comprising:

an asynchronous mirroring driver software module for intercepting I/O transactions to a storage disk of the local storage system, identifying a series of write transactions issued to said storage disk, making an exact copy of the series of

write transactions, and storing said exact copy within a series of files that are created on a file-system of the local storage system; and

a first asynchronous mirroring coordinator software module for invoking a configured file transfer system to transmit the series of files to a file system on the remote storage system via a non-proprietary network protocol to accommodate an exact reproduction at the remote storage system of the series of write transactions as issued to said storage disk of the local storage system.

6. (Previously Presented) The computer program product of claim 5 further comprising:

a second asynchronous mirroring coordinator software module installed on the remote storage system for detecting the series of files on the file system of the remote storage system, opening the files and reading the exact copy of the series of write transactions in these files, and issuing the exact copy of the series of write transactions to a storage device connected to the remote storage system that is configured to mirror the storage device on the local storage system.

7. (Previously Presented) The system of claim 1, wherein individual ones of the series of files comprise:

a Header portion that includes information on the total size of the file;

an I/O Control Block portion which indicates address offsets where each transaction in the file is to be stored on the remotely located destination storage system, and which further indicates the size of the data for each transaction; and

a Data portion which contains the data for each transaction in the file.

8. (Previously Presented) The system of claim 7, wherein the Header portion further includes:

a pointer to the I/O Control Block portion which indicates the offset where the I/O Control Block portion of the file begins; and

a pointer to the Data portion, which indicates the offset where the Data portion of the file begins.

9. (Previously Presented) The system of claim 1, wherein the asynchronous mirroring driver intercepts all I/O transactions in the system.

10. (Original) The method of claim 3, wherein intercepting I/O transactions comprises intercepting all I/O transactions in the system.

11. (Previously Presented) The computer program product of claim 5, wherein the asynchronous mirroring driver module intercepts all I/O transactions in the system.

12. (Cancelled).

13. (Cancelled).

14. (Cancelled).

15. (Cancelled).

16. (Cancelled).

17. (Cancelled).

18. (Previously Presented) The system of claim 1, wherein the asynchronous mirroring driver intercepts a transaction affecting the content or organization of a disk.

19. (Original) The method of claim 3, wherein intercepting I/O transactions comprises intercepting a transaction affecting the content or organization of a disk.

20. (Previously Presented) The computer program product of claim 1, wherein the asynchronous mirroring driver module intercepts a transaction affecting the content or organization of a disk.

21. (Previously Presented) The system of claim 1, wherein the series of write transactions is one of a plurality of series of I/O transactions that are respectively retained in corresponding ones of the series of files, and individual ones of the series of files include pointers to accommodate sequencing the series of files, whereby a transaction level record of changes to the storage disk of the local storage system is provided for the remote storage system.

22. (Previously Presented) The system of claim 21, wherein the plurality of series of I/O transactions include at least one formatting transaction and/or at least one partitioning transaction.

23. (Previously Presented) The method of claim 3, wherein the series of write transactions is one of a plurality of series of I/O transactions that are respectively retained in corresponding ones of the series of files, and individual ones of the series of files include pointers to accommodate sequencing the series of files, whereby a transaction level record of changes to the storage disk of the local storage system is provided for the remote storage system.

24. (Previously Presented) The method of claim 23, wherein the plurality of series of I/O transactions include at least one formatting transaction and/or at least one partitioning transaction.

25. (Previously Presented) The computer program product of claim 5, wherein the series of write transactions is one of a plurality of series of I/O transactions that are respectively retained in corresponding ones of the series of files, and individual ones of the series of files include pointers to accommodate sequencing the series of files, whereby a transaction level record of changes to the storage disk of the local storage system is provided for the remote storage system.

26. (Previously Presented) The computer program product of claim 25, wherein the plurality of series of I/O transactions include at least one formatting transaction and/or at least one partitioning transaction.

APPENDIX B – ADDITIONAL EVIDENCE

None.

APPENDIX C – RELATED PROCEEDINGS

None.